THE ANTITOXIN TREATMENT OF DIPHTHERIA IN THE CITY OF GLASGOW FEVER HOSPITAL, BELVIDERE, DURING SIX AND A HALF YEARS.

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The use of antitoxin in the treatment of diphtheria has now been on its trial in this country for nearly seven years, and has been the chief method of treatment employed in this hospital since the beginning of 1895. A short *résumé* of the results attained will, therefore, be not without use, especially as no general synopsis of these results beyond the issue of the hospital statistics year by year has been published since Dr. Marsh's paper in 1896.

The collective results are shown in Table I. This table consists of four divisions—the first showing the mortalities at different age-periods in the pre-antitoxin days, the second those in the last six and a half years, of all the cases treated in Belvidere. For the purposes of comparison the corresponding figures taken from the reports of the Metropolitan Asylums' Board, London, are also given. From the figures in these parallel columns the value of the remedy can easily be gauged, unless some other factor than antitoxin has been in progress at the same time. The mortality at all ages has been greatly lowered.[1] It is to be noticed that the improvement becomes more marked as the age-period increases from 1 to 10. Thus, the death-rates at the age of 1 in the two periods are respectively 70·6 per cent and 46·2 per cent—an improvement of 34 per cent; the death-rates of the two periods for the ages 5 to 10 are respectively 39·9 per cent and 9·7 per cent—an

[1] This decline in the mortality had not begun before the introduction of antitoxin, the mortality for 1893 and 1894 at each age-period being—83·3 per cent under 1 year, 64 per cent at 1-2 years, 60 per cent at 2-3 years, 47·7 per cent at 3-4 years, 37·5 per cent at 4-5 years, 33·9 per cent at 5-10 years, and above that age 6 per cent.

improvement of 75 per cent. This difference is the more noteworthy as showing that the saving of life has not been so much among the very young as among those of 2 years old and upwards. The high death-rate at the ages of 10 years and upwards merits some remark. It may be in part due to the smallness of the numbers, but in large measure it is to be explained by the fact, which an examination of the case records made quite clear, that at least one-third of persons

TABLE I.—SHOWING THE TOTAL NUMBER OF CASES ADMITTED TO THE CITY OF GLASGOW FEVER HOSPITAL, BELVIDERE, 1871-31st MAY, 1901, IN TWO GROUPS—1st, 1871-1894 (PRE-ANTITOXIN PERIOD), AND 2nd, 1895-1901 (ANTITOXIN PERIOD), WITH THE CORRESPONDING STATISTICS FOR THE METROPOLITAN ASYLUMS' BOARD HOSPITALS, LONDON, IN TWO GROUPS—1890-1894 (PRE-ANTITOXIN PERIOD), AND 1898-1899 (ANTITOXIN PERIOD).

	Glasgow.						London.					
	Pre-Antitoxin Period (1871-94).			Antitoxin Period (1st Jan., 1895, to 31st May, 1901).			Pre-Antitoxin Period (1890-94).			Antitoxin Period (1895-99).		
Ages.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
-1	17	12	70·6	67	31	46·2	179	116	64·8	510	193	37·8
1-2	91	61	67·0	183	71	38·8	641	396	61·7	1719	610	35·5
2-3	85	51	60·0	175	41	23·4	896	489	54·5	2582	684	26·4
3-4	106	49	46·2	184	25	13·6	1163	546	46·9	3486	801	22·9
4-5	82	38	46·3	135	20	14·8	1222	479	39·2	3666	759	20·7
5-10	233	93	39·9	308	30	9·7	3461	946	27·3	10578	1584	14·9
10-20	93	9	9·6	86	9	10·4	1959	151	7·7	4681	248	5·3
20-30	66	6	9·0	59	3	5·1	844	38	4·5	1154	21	1·8
30-	17	...	...	31	5	16·1	412	35	8·5	659	28	4·2
Total,	790	319	40·4	1228	235	19·1	10777	3196	29·6	29035	4928	16·9

dying at the higher ages were admitted in a moribund condition. It would seem that the hospital did not receive anything like a fair average of the disease at the higher ages such as seems to be the case with the hospitals in London. The comparative figures for London given in the third section of the table are interesting as showing that the Glasgow mortality compares very favourably with that in the south on the whole. It will be seen that the number of cases at different ages is very different. If a thousand cases be taken at the ages at

which they occur in the above table, they will be distributed in the two localities in the manner shown in the annexed table.

It will be seen from Table II that in Glasgow a much larger proportion of the cases occur at the early ages, and in consequence that although the crude death-rates shown in Table I are lower for London, yet that the corrected rate, allowing for difference of age-incidence, is rather in our favour, being 14·3 per cent as against 16·9 per cent, even although the fatality is so high in Glasgow at ages above 10, and the number of cases at 10 to 20 is less than half that of London.

In order that fuller detail of the difference may be easily

TABLE II.—RELATIVE PROPORTION IN 1,000 CASES AT DIFFERENT AGES OF THE CASES OF DIPHTHERIA TREATED IN GLASGOW AND LONDON, WITH THE APPLICATION OF THE GLASGOW DEATH-RATES TO THE LONDON AGE-INCIDENCE OF CASES.

Glasgow.			London.	
Ages.	Number with Ages of 1,000 Cases.	Death-rate.	Number with Ages of 1,000 Cases.	Proportion of Deaths at the Glasgow Death-rates.
-1	54·6	46·2	17·5	8·1
1-2	149·3	38·2	59·2	22·6
2-3	142·8	22·8	88·9	20·3
3-4	149·4	13·6	120·0	16·3
4-5	108·5	15·0	126·2	18·9
5-10	251·4	9·7	364·3	35·3
10-20	70·2	10·4	161·2	16·7
20-30	48·1	5·1	39·7	2·0
30-	25·3	16·1	22·6	3·6
		19·0		14·3*

* That is, the Glasgow death-rate corrected to the London figures is 14·3.

seen, the following table (Table III) is annexed, in which the percentage mortalities at each age-period are given in parallel columns for both London and Glasgow since the commencement of the treatment of diphtheria by antitoxin.

The great difficulty in obtaining uniformly good results in the treatment of diphtheria is to be found in the rapidity with which progress of the disease lessens the chance of successful treatment. As an illustration of this Table IV is given. In this table the cases admitted last year are arranged in groups, according to the periods at which they came under treatment, and the corresponding death-rates given. Of those treated on

the first day of illness all recovered, and those received on the second day, 2 out of 22, or 9 per cent died, while the further delay causes a corresponding increase in the mortality. Thus the paradox: that it is better for a child to become immediately ill, or to take what appears to be a severe attack of

TABLE III.—COMPARATIVE TABLE OF THE PERCENTAGE MORTALITY FROM DIPHTHERIA AT DIFFERENT AGE-PERIODS IN THE METROPOLITAN ASYLUMS BOARD'S HOSPITALS, LONDON, AND IN THE CITY OF GLASGOW FEVER HOSPITAL, BELVIDERE, 1895-1900.

Ages.	Glas. 1st Jan., 1895, to 31st May, 1896.	Lond. 1895.	Glas. 1896-97.	Lond. 1896.	Glas. 1897-98.	Lond. 1897.	Glas. 1898-99.	Lond. 1898.	Glas. 1899-00.	Lond. 1899.
-1	40·0	38·7	58·3	52·0	60·0	32·3	58·3	33·0	37·5	37·4
1-2	31·2	46·6	33·3	46·2	48·4	31·8	47·0	32·3	29·4	29·6
2-3	12·8	33·1	30·0	31·2	35·7	26·9	28·5	26·1	26·6	21·3
3-4	16·6	30·2	19·2	25·6	14·8	22·8	10·7	20·5	7·8	20·1
4-5	12·5	29·4	8·6	25·2	11·7	20·7	33·3	19·1	10·0	15·5
5-10	6·2	19·5	13·0	18·7	5·8	16·4	10·7	12·7	14·2	11·8
10-15	7·7	8·5	...	8·4	16·6	4·7	9·0	5·1	...	5·3
15-20	10·0	7·3	40·0	5·8	22 2	2·4	...	1·8	...	1·6
20-25	12·5	1·3	...	1·9	25·0	4·2	...	1·2	12 5	·9
25-30	...	3·1	...	1·2	...	3·2	...	...	...	1·4
30-	16·6	2·2	28·3	2·3	...	10·1	14·3	3·4	20·0	2·8

diphtheria and thus come at once under treatment, than to take an apparently milder attack, which, in the parents' mind, is not of sufficient gravity to demand the attention of a

TABLE IV.—NUMBER OF CASES OF DIPHTHERIA ADMITTED ON EACH DAY OF ILLNESS, WITH THE CORRESPONDING MORTALITY.

Day of Disease.	Number of Cases.	Number of Deaths.	Percentage of Mortality.
First, ...	8	...	...
Second, ...	22	2	9·0
Third and fourth, . .	58	9	15·5
Fifth and upward, . .	96	19	19·8

medical attendant till the illness has progressed for several days.

Of all the cases received, a considerable proportion are, on admission, beyond the reach of treatment. This number varies in different years; in all, it has amounted to 73 in the period

of six and a half years. If a child dies within twenty-four hours of admission, it may be fairly said to be beyond medical aid when it is received. I have, therefore, in order that the comparative results of the antitoxin treatment, during

TABLE V.—SHOWING THE RESULTS OF THE SERUM TREATMENT OF DIPHTHERIA IN BELVIDERE, 1895-1901. CASES COMING TO THE HOSPITAL MORIBUND (*I.E.*, DYING WITHIN TWENTY-FOUR HOURS OF ADMISSION) ARE EXCLUDED FROM THIS TABLE AS BEING BEYOND TREATMENT ON ADMISSION.

Ages.	1895-1896.			1896-1897.			1897-1898.		
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
-1	13	4	30·7	11	6	54·5	10	6	60·0
1-2	25	5	20·0	22	6	27·2	27	10	37·0
2-3	38	3	8·0	17	3	17·6	14	5	35·7
3-4	28	6	21·4	25	4	16·0	27	4	14·8
4-5	22	3	13·6	22	1	4·5	16	1	6·2
5-10	63	1	1·6	43	3	6·9	49	1	2·0
10-	41	2	4·8	26	1	3·8	22	4	18·1
Total,	230	24	10·4	166	24	14·4	165	31	18·7

Ages.	1898-1899.			1899-1900.			1900-1901.		
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
-1	6	1	16·6	13	3	23·0	6	...	...
1-2	30	12	40·0	30	6	20·0	22	7	31·8
2-3	27	7	25·9	37	7	18·9	32	5	15·6
3-4	28	3	10·7	37	2	5·4	31	1	3·2
4-5	21	5	23·8	30	3	10·0	16	1	6·2
5-10	56	6	10·7	47	5	10·6	41	3	7·3
10-	31	2	6·4	27	2	7·4	24	1	4·1
Total,	199	36	18·0	221	28	12·6	172	18	10·4

the different years since its inception, may become clear, prepared Table V (p. 5), in which the diphtheria cases, deaths, and death-rates, are given for each age-period, after excluding all cases dying within twenty-four hours of admission. It will thus be seen that the disease apparently increased

in severity from 1895 to 1898, and since that time has apparently decreased in severity, or has become more amenable to treatment.

TABLE VI.—LARYNGEAL CASES OF DIPHTHERIA: PRE-ANTITOXIN AND ANTITOXIN PERIODS.

Ages.	1871-1894.			1895-1896.			1896-1897.			1897-1898.		
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
-1	6	6	100·0	6	4	66·6	6	4	66·6	6	4	66·6
1-2	61	49	80·3	23	10	43·4	15	4	26·6	21	10	47·6
2-3	51	41	80·3	28	6	21·4	16	5	31·2	11	3	27·2
3-4	56	37	66·0	17	5	29·4	11	3	27·2	17	4	23·5
4-5	49	30	61·2	18	4	22·2	15	...	...	6	2	33·3
5-10	82	58	70·7	21	2	9·5	22	4	18·2	18	2	11·1
10-20	10	4	40·0	1	...	...	...	...	...	1	1	100·0
20-30	5	3	60·0	...	...	...	...	...	...	...	...	...
30-	1	...	...	1	...	...	...	...	...	...	...	...
Total,	321	228	71·0	115	31	26·9	85	20	23·5	80	26	32·5

Ages.	1898-1899.			1899-1900.			1900-1901.			Total—1895-1901.		
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
-1	7	6	85·7	11	4	36·3	3	...	...	39	22	56·4
1-2	23	11	47·8	24	6	25·0	16	7	43·7	122	48	39·3
2-3	21	5	23·8	34	6	17·6	20	4	20·0	130	29	22·3
3-4	14	3	21·4	24	1	4·1	22	4	18·1	105	20	19·0
4-5	11	2	18·1	16	...	...	10	2	20·0	76	10	13·1
5-10	31	4	12·9	19	4	21·0	13	1	7·6	124	17	13·7
10-20	...	...	...	...	...	...	...	...	...	2	1	50·0
20-30	1	...	...	...	...	...	...	...	...	1	...	...
30-	...	...	...	...	...	...	...	...	...	1	...	...
Total,	108	31	28·7	128	21	16·4	84	18	21·4	600	147	24·5

There remains to be dealt with at some little length the nature of the cases which have been received into Belvidere

in these years under review. By far the most fatal form of diphtheria is that in which the larynx is affected. Here there is a definite form of obstruction to the breathing, as well as an acute poisoning, and as the effect of the latter is to greatly weaken the heart, it is obvious that the double strain thus

TABLE VII.—NUMBER OF TRACHEOTOMIES AND INTUBATIONS (OR BOTH) AT DIFFERENT AGE PERIODS—1895-1901.

31st May, 1895-96			1896-97.		1897-98.		1898-99.		1899-1900.		1900-01.		Total.		Percentage of Mortality.
Ages.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	
-1	2	2	3	3	4	4	7	6	2	2	1	...	19	17	89·5
1-2	9	7	8	4	13	9	13	8	13	5	12	7	68	40	58·8
2-3	4	...	5	2	5	2	12	5	21	5	9	3	56	17	30·3
3-4	5	...	2	.	8	4	11	2	11	..	15	4	52	10	19·2
4-5	5	...	6	...	...	..	10	3	13	..	1	1	38	4	10·5
5-10	8	1	8	3	6	2	9	2	12	4	5	1	48	13	27·1
10-20	1	1	...	...	...	...	...	...	...	...	...	...	1	1	100·0
Total.	34	11	32	12	36	21	62	26	72	16	46	16	282	102	36·1

imposed on the patient must greatly lessen his chance of recovery. In the pre-antitoxin period these cases were especially fatal. A glance at Table VI (p. 6) will show the marked improvement here attained.

TABLE VIII. TOTAL CASES, DEATHS, AND DEATH-RATES OF ABOVE PRE-ANTITOXIN AND ANTITOXIN PERIODS.

Age.	1872-1894.			1st January, 1895-1901.		
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
Under 5 years, .	93	74	79·5	242	92	37·6
Over 5 years, . .	42	35	83·3	51	14	27·4

The fatality under one year of age is still very high, and there seems little hope of this being improved unless the cases can be brought under treatment at a much earlier period of the disease. Sucklings are much more profoundly affected by

diphtheria than even children at the age of one year. In addition, they bear the operation of tracheotomy so badly as to render its use the last resort. Even among these infants, however, there has been a considerable saving of life. As, however, the age increases, this saving becomes more marked, ranging from 50 per cent at the age of one year to 80 per cent at the ages of 5 to 10. This improvement, as may be seen by reference to the table, has been of fairly uniform character, the years in which the case mortality has been highest being

TABLE IX.—TOTAL NUMBER OF TRACHEOTOMIES, &c., 1895-1901, WITH THE PERCENTAGE OF SUCH CASES TO THE TOTAL NUMBER OF DIPHTHERIA CASES SENT TO HOSPITAL.

	1st January, 1895, to 31st May, 1896.			1896-1897.			1897-1898.		
	Cases	Deaths.	Percentage of Mortality.	Cases	Deaths.	Percentage of Mortality.	Cases	Deaths.	Percentage of Mortality.
Tracheotomies	46	15	32·6	32	12	37·5	36	21	58·3
Total cases, -	242	35	14·4	180	38	21·1	174	40	22·9
Percentage of tracheotomies to total cases,	19·0			17·7			20·7		
	1898-1899.			1899-1900.			1900-1901.		
	Cases	Deaths.	Percentage of Mortality.	Cases	Deaths.	Percentage of Mortality.	Cases	Deaths.	Percentage of Mortality.
Tracheotomies	62	26	41·9	72	16	22·2	46	16	34·7
Total cases, -	213	50	23·4	235	42	17·8	182	28	15·4
Percentage of tracheotomies to total cases,	29·1			30·6			25·3		

those of 1897, 1898, 1899, the years in which diphtheria was least prevalent in Glasgow in this decade. Among the laryngeal cases occur those in which tracheotomy or intubation may be required. As the latter operation was not found of much service, and as it was often followed by the graver operation of tracheotomy, the results of both have been gathered together in Tables VII, VIII, and IX. From these tables several conclusions can easily be drawn. It is evident that now the mortality of tracheotomy is only high in the first two years of life. In the pre-antitoxin period it was almost equally useless

at all periods of life, only one patient in five surviving the ordeal. Now, with about two out of every three persons recovery takes place. This is a very marked change, indeed, and it does not represent the whole truth. Many patients who are so suffocated as to demand operative relief improve so much under the influence of antitoxin as not to require further interference. Another noteworthy point is that the proportion of cases requiring tracheotomy to the whole number has risen very markedly, as may be seen in Table IX. The reason of this is not, as might appear, that the operation is more frequently resorted to at present than formerly. I saw

TABLE X.—SHOWING AMOUNT OF DIPHTHERIA IN GLASGOW SINCE THE INTRODUCTION OF THE NOTIFICATION ACT, AND ALSO THE RELATIVE NUMBER OF CASES TREATED IN THE HOSPITAL AND AT HOME, WITH THE CORRESPONDING DEATHS AND DEATH-RATES.

Year.	Case Rate per 1,000,000 Population.	Total Cases in City.	Total Deaths in City.	Percentage of Mortality.	Treated in Fever Hospital, Belvidere.			Treated at Home.		
					Cases	Deaths.	Percentage of Mortality.	Cases	Deaths.	Percentage of Mortality.
1891	822	465	131	28·2	80	31	38·7	385	100	25·9
1892	861	575	195	33·9	78	29	37·2	497	164	33·0
1893	1228	828	246	29·7	153	62	40·5	675	184	27·2
1894	1414	967	290	39·0	245	87	35·5	722	203	28·1
*1895	944	654	137	21·0	179	25	14·0	475	112	23·5
1896	854	601	116	19·3	179	34	19·0	422	82	19·4
1897	647	462	127	27·5	123	30	24·5	339	97	28·6
1898	592	433	113	26·0	203	45	22·1	230	65	28·2
1899	622	465	109	23·5	213	27	12·6	252	82	32·5
1900	715	540	125	23·1	248	50	20·1	292	75	25·6

*First antitoxin year.

myself nearly all the cases on which tracheotomy was performed in the winter of 1895-96, when Dr. Marsh, who had considerable experience of diphtheria, was in charge of the wards, and I do not think that during last year there was a single tracheotomy done in which the urgency was less than in the former series of cases. The cause is to be found in another direction. During the same period a great change in the knowledge of diphtheria has taken place among the medical practitioners who first see the cases, and many cases are now certified diphtheria which were formerly classified together under the name of croup. This change is measured

by the fact, that while in 1895, 73 deaths in the city of Glasgow were registered as simple croup, in 1900 only 19 were so registered, though the amount of diphtheria in the city is nearly the same. It is from these formerly wrongly diagnosed cases that the hospital is now receiving its increased number of patients requiring tracheotomy, and the fact that these show a diminished diphtheria death-rate argues largely for the potency of the antitoxin treatment.

It remains to discuss the relative results of home and hospital treatment, and the function which a modern infectious disease hospital plays in the civic economy. First, the course of the epidemic is given in the first column of Table X. It will be seen that it culminated in the year 1894, that from

TABLE XI.—SHOWING THE CASES TREATED IN THE HOSPITAL AND AT HOME, THOSE CASES WHICH DIED WITHIN TWENTY-FOUR HOURS OF ADMISSION BEING CLASSED AS CASES TREATED AT HOME.

Year.	Treated at Belvidere Hospital.			Treated at Home.			Deaths in Glasgow certified Croup.
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	
1895	173	19	10·9	481	118	24·5	73
1896	167	22	13·1	434	94	21·6	54
1897	113	20	17·7	349	107	30·6	48
1898	192	34	17·7	241	76	31·5	29
1899	200	14	7·0	265	95	35·8	17
1900	229	31	13·5	311	94	30·2	19

that year till 1898 there was a continuous fall, and that since then there has been a tendency for the disease to again increase in extent. It has been asserted by a French writer that the death-rate in diphtheria bears a relation to the extent of the epidemic—*i.e.*, if there is much diphtheria, then not only are there more deaths, but also more in proportion to the number of cases. The only point where the Glasgow statistics show this relation is between 1894 and 1895, but that is the point at which treatment by antitoxin was begun, and it must be noted that the fall in the hospital mortality greatly exceeded the corresponding fall in the cases treated. Though after this the epidemic continued to diminish in extent, yet the mortality in both the cases treated in hospital and at home continued to increase.

Before the introduction of antitoxin the hospital mortality regularly exceeded that outside: since the introduction of that remedy it has as regularly been less. This is not a phenomenon confined to Glasgow, but, as may be seen in the accompanying tables, is the rule in large towns. Nor, as I showed earlier, when speaking in regard to tracheotomy, is it

TABLE XII.—SHOWING THE AMOUNT OF DIPHTHERIA IN A NUMBER OF LARGE TOWNS SINCE 1897, AND ALSO THE RELATIVE NUMBER OF CASES TREATED IN THE HOSPITAL AND AT HOME, WITH THE CORRESPONDING DEATHS AND DEATH RATES.

Year.	Total.			Treated at Home.			Treated in Hospital.		
	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.	Cases.	Deaths.	Percentage of Mortality.
LIVERPOOL.									
1897	463	125	27·0	265	88	33·1	198	37	18·7
1898	590	148	25·1	492	130	26·4	98	18	18·7
1899	851	218	25·6	586	149	25·5	265	69	26·0
1900	761	163	21·4	491	112	22·7	270	51	19·0
MANCHESTER.									
1897	150	46	30·6	106	36	33·9	44	10	22·7
1898	196	51	26·0	113	36	31·9	83	15	18·1
1899	248	85	34·2	136	51	37·5	112	34	30·3
1900	337	101	29·9	156	66	42·3	181	35	19·4
ABERDEEN.									
1897	93	14	15·1	67	12	17·9	26	2	7·7
1898	209	37	17·7	130	33	25·4	79	4	5·1
1899	153	29	18·9	75	21	28·0	78	8	10·3
1900	128	30	23·4	46	24	52·1	82	6	7·3

likely that this is due to the fact that the hospital gets more of the milder cases now. As it was pointed out by Dr. Marsh in his paper in 1896, the cases of wrong diagnosis which are sent to the hospital as diphtheria, consisting, as they do, very largely of scarlatina and tonsillitis, have a much smaller mortality than those of diphtheria, and among the cases left at home those wrong diagnosis serve largely to dilute the

death-rate. In addition, a majority of those cases requiring immediate tracheotomy are sent instantly to the hospital. Both these cases should serve to make the death-rate of the hospital higher than that of the home-treated cases, but such, as may be seen in Table X, is very far from the case. In addition, if those cases which die within twenty-four hours of admission are subtracted from the hospital numbers and added to those of the outside, the disparity becomes more marked. This, I think, can fairly be done, as the bulk of the moribund cases are received on the third day of illness and upward. On the other hand, the fulminant cases of diphtheria admit of little treatment, and must be put to the credit side of the high outside death-rate. Deceptive enough they are even to those who are in the habit of working with the disease.

These remarks serve to emphasise several points. Firstly, necessity of early diagnosis of diphtheria. Secondly, that if there be reasonable suspicion that the disease is diphtheria, a small dose of antitoxin should be administered at once. It will do the child no harm, and will serve to retard the development of the disease. Thirdly, that if the disease be advanced at all when first seen, the patient should be at once removed to hospital, or receive a sufficient curative dose of the remedy. As this may cost about 10s., it will be seen that it is outwith the resources of many to whom their necessity requires it. If these patients are to be treated at home, then either the city or the parochial authorities should bear the expense, as is done in some of the large towns in England.

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